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Observations of the Comet of 1812 (*Pons-Brooks*) *at its return to Perihelion in* 1884. By John Tebbutt.

I herewith forward my complete observations of this interesting comet. They were made with a square bar-micrometer on the 4½-inch Equatorial. The comet ceased to be visible to the unassisted eye on February 22. From January 13 to February 9 it presented a stellar nucleus which admitted of precise observation, and from the latter date to March 2 there was an ill-defined condensation which could be observed with tolerable accuracy. After March 2 it was difficult to observe the comet, for it appeared as a round nebula with scarcely any condensation in its centre. On April 1 it was excessively faint in consequence of the increasing moonlight. After the withdrawal of the full moon the comet was found again on April 21, but it was of the last degree of faintness, and its position could therefore be only roughly determined as follows:—

April 21 7ʰ 27ᵐ 14ˢ Windsor M.T. App. R.A. = 4ʰ 17ᵐ 53ˢ·8.

App. N.P.D. 155° 45′ 37″.

In determining the places of the comparison stars proper motion has been applied where practicable. The parallax corrections are based on Schulhof and Bossert's Ephemerides in Nos. 2558, 2569, and 2570 of the *Astronomische Nachrichten*, with an assumed equatorial horizontal solar parallax of 8″·85.

Apparent Places of the Comet of 1812 (Pons-Brooks).

Windsor M. T.					App. R.A.			App. N.P.D.			Parallax Corrections. R.A. +	Parallax Corrections. N.P.D. +	No. of Comps.	Comp. Star.
1884.	d	h	m	s	h	m	s	°	′	″	s	″		
Jan.	13	8	25	55	23	3	46·24	88	20	32·6	0·73	7·7	7	1
	19	8	19	13	23	37	33·25	99	14	9·2	0·68	6·4	5	2
	19	8	24	8	*	+5	21·84	*	−1	35·0	0·69	6·5	6	3
	21	8	30	14	23	47	37·43	102	35	24·3	0·68	6·0	6	4
	21	8	30	14	23	47	37·30	102	35	19·4	0·68	6·0	6	5
	22	8	6	50	23	52	18·26	104	9	53·4	0·65	5·6	5	6
	23	8	17	24	23	56	58·69	105	43	42·2	0·65	5·4	3	7
	23	8	17	24	23	56	58·78	105	43	44·9	0·65	5·4	3	8
	25	8	32	16	0	5	49·45	108	42	6·6	0·66	5·2	8	9
Feb.	2	8	22	40	*	−1	41·27	*	+15	42·7	0·61	3·5	5	10
	2	8	22	40	0	35	28·30	118	37	1·6	0·61	3·5		11
	2	8	22	40	0	35	28·39	118	36	58·8	0·61	3·5	5	12
	4	8	24	37	0	41	42·29	120	40	3·8	0·61	3·3	14	13

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Windsor M. T.					App. R.A.			App. N.P.D.			Parallax Corrections.		No. of Comps.	Comp. Star.
											R.A.	N.P.D.		
											+	+		
1884.	d	h	m	s	h	m	s	°	′	″	s	″		
	5	8	34	54	0	44	40·81	121	38	35·7	0·62	3·3	5	14
	5	8	34	54	0	44	40·62	121	38	32·0	0·62	3·3	5	15
	5	8	34	54	0	44	40·54	121	38	50·8	0·62	3·3	5	16
	8	8	33	13	0	52	59·38	124	20	16·5	0·61	3·0	10	17
	9	8	23	28	0	55	35·17	125	10	2·6	0·60	2·7	3	18
	9	8	23	28	0	55	34·95	125	10	3·0	0·60	2·7	3	19
	10	8	22	9	0	58	6·37	125	58	18·4	0·60	2·6	10	20
	17	8	53	48	1	14	12·69	130	54	34·1	0·61	2·8	5	21
	17	8	53	48	1	14	12·15	130	54	35·0	0·61	2·8	5	22
	22	8	16	26	1	24	24·46	133	47	58·6	0·59	1·9	10	23
	22	8	16	26	1	24	23·97	133	47	56·7	0·59	1·9	10	24
	22	8	58	42	1	24	28·11	133	48	56·4	0·61	2·8	5	23
	25	8	36	50	1	30	20·26	135	22	3·1	0·60	2·3	4	25
	25	8	36	50	1	30	19·96	135	22	2·6	0·60	2·3	4	26
	25	8	36	50	1	30	19·73	135	22	0·4	0·60	2·3	4	27
	25	8	36	50	1	30	19·72	135	22	2·2	0·60	2·3	4	28
	26	8	25	18	1	32	15·74	135	51	27·6	0·60	2·0	8	29
	29	8	41	41	1	38	6·24	137	16	49·7	0·60	2·3	4	30
Mar.	2	8	4	26	1	41	56·04	138	9	50·0	0·59	1·6	3	31
	2	8	4	26	*	−5	40·18	*	+4	33·6	0·59	1·6	3	32
	7	8	42	43	1	51	53·84	140	17	9·5	0·61	2·3	1	33
	8	7	37	4	1	53	49·86	140	39	52·4	0·58	1·0	1	33
	8	7	37	4	1	53	49·69	140	39	50·9	0·58	1·0	1	34
	9	8	2	39	1	55	55·38	141	4	0·6	0·60	1·6	4	35
	9	8	2	39	1	55	55·61	141	4	3·9	0·60	1·6	4	36
	9	8	2	39	1	55	55·26	141	3	59·9	0·60	1·6	4	37
	9	8	59	13	1	56	0·71	141	4	55·3	0·61	2·7	7	37
	14	8	7	51	*	−1	56·14	*	−3	10·8	0·62	1·7	6	38
	14	8	7	51	2	6	35·94	142	58	52·8	0·62	1·7	6	39
	21	8	3	59	2	23	0·92	145	30	57·0	0·64	1·6	3	40
	21	8	18	13	2	23	3·82	145	31	5·3	0·64	1·9	7	41
	24	8	2	21	2	30	48·05	146	34	18·6	0·65	1·6	2	42
	24	8	2	21	2	30	46·99	146	34	17·0	0·65	1·6	2	43
	24	8	2	21	2	30	47·20	146	34	15·3	0·65	1·6	2	44
April	1	8	25	25	2	54	14·21	149	20	10·9	0·68	2·0	8	45
	1	8	25	25	2	54	13·94	149	20	9·7	0·68	2·0	8	46

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Mean Places of the Comparison Stars for 1884·0, *and the Reductions to the Apparent Places for the Dates of Observation.* By John Tebbutt.

Star.	Mean R.A.	Reduction.	Mean N.P.D.	Reduction.	Authority for Mean Place.
	h m s	s	° ′ ″	″	
1	23 2 44·38	−0·10	88 30 12·4	− 3·6	Lamont 9097; Radcl. Obs. 1858, 1491; Wash. Cat. 1860, 10184; Greenw. 7 Yr. Cat. 1864, 2646; Bruxelles Obs. 1873, 3980 (Lamont N.P.D. rejected).
2	23 35 37·44	−0·11	99 27 53·4	+ 1·1	Schj. 9783.
3	23 32 12	−0·12	99 16	+ 0·9	Approx. Position per Equat. Star 6½ mag.
4	23 41 17·30	−0·14	102 33 8·5	+ 2·2	Schj. 9832, 9833; Greenw. 9 Yr. Cat. 1872, 2224; Bruxelles Obs. 1873, 4109; Cape Cat. 1880, 12286.
5	23 46 49·53	−0·11	102 39 37·2	+ 2·5	Schj. 9890.
6	23 56 16·50	−0·09	104 3 16·0	+ 3·3	Lalande 47123.
7	23 56 51·12	−0·12	105 41 7·0	+ 3·8	Arg. Oeltzen, 23201.
8	0 2 21·07	−0·09	105 28 11·3	+ 4·0	„ 6.
9	0 6 14·96	−0·14	108 34 55·0	+ 5·0	„ 47; Wash. Cat. 1860, 54.
10	0 37 10	−0·27	118 21	+ 8·8	Approx. Position per Equat. Star 8½ mag.
11	0 39 28·75	−0·26	118 24 11·9	+ 9·0	A. O. 395; Cord. Zone 95, 13 and 96, 18.
12	0 50 17·87	−0·20	118 24 15·5	+ 9·6	A. O. 516 and 517; Wash. Cat. 1860, 486; Cord. Zone 97, 11; Cape Cat. 1880, 365.
13	0 40 58·37	−0·33	120 49 30·4	− 9·4	A. O. 410; Wash. Merid. Tr. Zone 77, 100; Wash. Cat. 1860, 384; Cord. Zone 90, 43; Radcl. Obs. 1880, 18; Cape Cat. 1880, 307 (Arg. Oeltzen N.P.D. rejected).
14	0 40 18·28	−0·36	121 20 39·8	+ 9·4	Cordoba Zone 77, 80.
15	0 45 59·51	−0·34	121 36 58·7	+ 9·8	Wash. Merid. Tr. Zone 87, 46; Cord. Zone 77, 90.

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Star	Mean R.A.	Reduction.	Mean N.P.D.	Reduction.	Authority for Mean Place.
	h m s	s	° ′ ″	″	
16	0 46 17·79	−0·33	121 35 39·5	+ 9·9	Wash. Merid. Tr. Zone 87, 47; Cord. Zone 77, 91 (N.P.D. unsatisfactory; the authorities differ by 28″·2).
17	0 59 4·24	−0·38	124 9 17·4	+10·9	Wash. Merid. Tr. Zone 100, 19; Wash. Cat. 1860, 555; Cord. Zone 49, 53; Cape Cat. 1880, 418 (Wash. M. Tr. Zone N.P.D. rejected).
18	0 53 55·34	−0·45	125 15 48·5	+10·7	Wash. Mural Cir. Zone 83, 16; Wash. Cat. 1860, 512; Cord. Zone 101, 5; Cape Cat. 1880, 384 (W. Mural Cir. Zone R.A. rejected).
19	1 0 50·90	−0·41	125 25 7·9	+11·2	Cord. Zone 101, 13; Cape Cat. 1880, 429.
20	1 1 0·15	−0·45	126 16 52·3	+11·2	Wash. Mural Cir. Zone 80, 2; Wash. Cat. 1860, 577; Wash Obs. 1873, 45; Cord. Zone 101, 12; Cape Cat. 1880, 431. The individual results for N.P.D. inconsistent.
21	1 0 1·50	−0·71	130 53 28·6	+10·9	Cord. Zone 85, 91; Cape Cat. 1880, 425.
22	1 13 10·45	−0·64	130 42 52·0	+11·9	,, 85, 107.
23	1 23 19·66	−0·80	133 54 45·8	+12·2	Melb. Cat. 1870, 97; Cord. Zone 104, 29; Cape Cat. 1880, 580
24	1 24 24·60	−0·79	133 45 13·2	+12·3	Cord. Zone 104, 31.
25	1 19 39·60	−0·92	135 7 57·6	+11·5	,, 38, 67 and 104, 27; Cape Cat. 1880, 554.
26	1 27 47·08	−0·89	135 20 6·6	+12·2	,, 38, 79.
27	1 31 47·16	−0·88	135 23 51·6	+12·6	,, 38, 83.
28	1 33 48·87	−0·85	135 11 8·9	+12·7	,, 38, 85; Cape Cat. 1880, 653.
29	1 26 43·20	−0·95	136 10 24 1	+12·0	Melb. Obs. 1874, 32; Cord Zone 38, 77; Cape Cat. 1880, 606.
30	1 24 35·83	−1·07	137 21 25·1	+11·3	Cape Cat. 1880, 587.
31	1 45 40·63	−1·07	138 23 36·5	+12·8	Cord. Zone 16, 63; Cape Cat. 1880, 732.

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Star.	Mean R.A.	Reduction.	Mean N.P.D.	Reduction.	Authority for Mean Place.
	h m s	s	° ′ ″	″	
32	1 47 37	−1·04	138 5	+13·0	Approx. Position per Equat. Star 8½ mag.
33	1 51 41·22	−1·24	140 24 16·3	+12·4	Cord. Zone 9, 56 and 83, 156; Cape Cat. 1880, 769.
33	1 51 41·22	−1·26	140 24 16·3	+12·1	,, ,, ,,
34	1 57 31·84	−1·25	140 41 17·3	+12·7	Cord. Zone 9, 60; 83, 164 and 116, 4.
35	1 44 20·26	−1·36	141 3 39·6	+11·3	,, 83, 144; Cape Cat. 1880, 722.
36	1 46 24·34	−1·33	140 46 50·6	+11·4	,, 83, 148; Melb. Obs. 1875,35; Cape Cat. 1880,738.
37	1 57 54·02	−1·29	141 3 7·8	+12·5	,, 83, 165.
38	2 8 34	−1·47	143 2	+12·4	Approx. Position per Equat. Star 9 mag.
39	2 11 37·33	−1·44	142 44 53·1	+12·7	Cord. Zone 119, 17; Cape Cat. 1880, 907.
40	2 35 20·56	−1·66	145 30 12·4	+13·3	Cord. Zone 128, 13; Cape Cat. 1880, 1079. (The N.P. distances of Nos. 1078 and 1079 of the Cape Cat. 1880 have obviously been interchanged. The N.P.D. of 1078 adopted.)
41	2 15 50·80	−1·78	145 32 56·1	+11·3	Cord. Zone 98, 116.
42	2 16 8·74	−1·92	146 28 39·1	+10·5	,, 98, 119; Cape Cat. 1880, 936.
43	2 37 54·57	−1·81	146 28 21·9	+12·8	,, 128, 16.
44	2 38 10·02	−1·84	146 47 29·5	+12·8	,, 128, 18; Cape Cat. 1880, 1108.
45	2 54 40·06	−2·20	149 22 9·2	+12·3	,, 91, 13.
46	3 0 36·73	−2·17	149 23 6·2	+12·9	,, 91, 22; Cape Cat. 1880, 1271.

Windsor, N. S. Wales:
1884 *July* 15.

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Ephemeris for Physical Observations

Greenwich Noon.		Angle of Position of ♃'s Axis.	Latitude of Earth above ♃'s Equator.	Latitude of Sun above ♃'s Equator.	Δ−L.	L−O.	Longitude of ♃'s Central Meridian.	Diff.	Corr. for Phase.
1884.		°	°	°	°	°	°	+ °	°
Oct.	20	22·860	−0·587	−0·327	− 8·979	15·125	92·73	4391·26	+0·35
	25	23·008	·632	·348	9·368	15·905	163·99	1·33	·38
	30	23·143	·676	·369	9·710	16·638	235·32	1·39	·41
Nov.	4	23·266	−0·719	−0·390	−10·001	17·321	306·71	1·45	+0·44
	9	23·376	·761	·411	10·239	17·949	18·16	1·52	·46
	14	23·474	·801	·431	10·420	18·519	89·68	1·58	·47
	19	23·559	·840	·452	10·538	19·028	161·26	1·65	·48
	24	23·632	·877	·473	10·590	19·471	232·91	1·73	·49
	29	23·692	·912	·493	10·573	19·844	304·64	1·80	·49
Dec.	4	23·741	−0·945	−0·514	−10·484	20·145	16·44	1·87	+0·48
	9	23·777	0·975	·534	10·320	20·370	88·31	1·94	·46
	14	23·801	1·002	·555	10·078	20·518	160·25	2·01	·44
	19	23·813	1·027	·575	9·758	20·586	232·26	2·08	·41
	24	23·813	1·049	·596	9·355	20·572	304·34	2·14	·38
	29	23·801	1·068	·616	8·871	20·477	16·48	2·20	·34
1885.									
Jan.	3	23·776	−1·084	−0·637	−8·307	20·302	88·68	4392·26	+0·30
	8	23·738	1·096	·657	7·666	20·049	160·94	2·31	·26
	13	23·688	1·104	·677	6·949	19·720	233·25	2·35	·21
	18	23·626	1·109	·698	6·161	19·319	305·60	2·38	·17
	23	23·552	1·110	·718	5·308	18·853	17·98	2·41	·12
	28	23·466	1·107	·738	4·398	18·332	90·39	2·42	·08
Feb.	2	23·371	−1·101	−0·758	−3·440	17·763	162·81	2·42	+0·05
	7	23·267	1·091	·778	2·444	17·153	235·23	2·41	·03
	12	23·155	1·078	·798	1·419	16·515	307·64	2·39	+ ·01
	17	23·036	1·063	·818	−0·378	15·861	20·03	2·35	·00
	22	22·914	1·045	·838	+0·666	15·202	92·38	2·30	·00
	27	22·790	1·025	·858	1·703	14·552	164·68	2·24	−·01
Mar.	4	22·667	−1·003	−0·878	+2·720	13·922	236·92	4392·18	−0·03
	9	22·547	0·981	·898	3·706	13·322	309·10	2·10	·06
	14	22·433	·958	·918	4·651	12·762	21·20	2·02	·09
	19	22·326	·935	·938	5·547	12·252	93·22	1·92	·13
	24	22·230	·912	·957	6·384	11·801	165·14	1·83	·18
	29	22·147	·890	·977	7·156	11·415	236·97	1·74	·22